Identifying the lead-lag relationship between the shariah (islamic) equity index and macroeconomic variables: Malaysia as a case study

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Abstract:

Islamic equity markets have been growing steadily particularly since the subprime crisis of 2007-2008 as an alternative investment outlet to the conventional equity markets. This paper makes an attempt to discern the factors that drive the Islamic stock markets. In particular, this paper investigates the lead-lag relationship between the Islamic equity index and macroeconomic variables. The standard time series techniques have been applied for the analysis. Malaysia is used as a case study. The findings tend to indicate that the Islamic equity index has been driven by the money supply(M2) and followed by the CPI, exchange rate and the industrial production. These findings have important policy implications for an emerging equity market such as Malaysia.

Keywords: Islamic equity index, macroeconomic variables, lead-lag, Malaysia

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1. Introduction: The Issues Motivating This Article

The claims of many finance literature are that the macroeconomic variables affect the stock return. Recent researchers provide empirical studies that show the macroeconomic variables have an impact on stock market such as, Mookerjee and Yu (1997) and Maysami and Koh (2000) for Singapore, Kwon et al. (1997) and Kwon and Shin (1999) for South Korea, and Habibullah and Baharumshah (1996) for Malaysia. All studies indicate that industrial production, consumer price index, exchange rate, money supply and so forth are crucial in explaining stock returns. However, it is not fully clear from their analysis as to which variable is leading and which variable is lagging the Islamic equity index. This is needed for helping the policy makers, investors and practitioners. This paper, therefore, aims to discern the lead-lag relationship between the Islamic equity market and the macroeconomic variables. Therefore essentially, there are two research questions that are raised in this study;

1. To what extent are the macroeconomic variables able to explain the variance of Islamic stock market?
2. Which of the macroeconomic variables will most affect the Islamic stock market?

Islamic stock market essentially is one of the product innovations in Islamic capital market. Historically, Islamic Capital Market of Malaysia was launched in year 1990 through its first issuance of Islamic Corporate Bond by Shell MDS Sdn. Bhd[1]. In year 1999, Malaysia had launched its first KLSE Shariah index to the domestic and global markets. One of the objectives was to establish Malaysia as an International Islamic Capital Market centre[2]. Eventually, the

[1] Please refer *The development of Syariah-compliant Structured Investment Fund –The Malaysian experience*, slide presentation by Datuk Mohamed Azahari Kamil, Managing Director, AmanahRaya Investment Bank Ltd Labuan

[2] Resolution of the Securities Commission Shariah Advisory council , Second Edition (2006).

present paper is a study about the relationship between the Islamic stock market and the influences of macroeconomic variables.

This paper, is divided into six sections. First section which is introduction will explain the issues that motivate the author to find out the relationship between the macroeconomic variables and Islamic stock market. Section two will identify clearly the main purpose of the study. Followed by section three that reviews the empirical studies for this area .Then, it is followed by the methodology used in section four. Data, Empirical Result and Discussion are explained in section five. Finally, this paper ends with the conclusions and the policy implications of the study in section six.

2. The Objective of the Study

Essentially, the purpose of the present study is to contribute further to the literature on Islamic finance system. Interestingly to note, this study is to ascertain the extent of influence of macroeconomic variables on the volatility of Islamic stock markets, especially in Malaysian Islamic equity market. It also seeks to find the empirical evidence of the behavior of Islamic stock market and its interaction with various macroeconomic variables. In addition to that, we attempt to address this issue through the application of standard and well accepted time series techniques. To analyze this issues we use several steps which consist of unit root test through Augmented Dickey Fuller (ADF). It is followed by the order of Vector Auto Regression (VAR), tests for cointegration, Long Run Structural Modeling (LRSM), vector error correction modeling, variance decomposition, Impulse response function (IRF), and finally the Persistence Profile.

3. Literature Review and Theoretical Framework

There are many studies that have been done to investigate the correlation between the macroeconomic variables and the stock market. Example of studies are Fama (1981)and Chen (1991) for the US market, Hamao (1988) on Japanese market and Poon, Taylor (1992) on the UK market, Kwon and Shin (1999) for Korean market and Maysami and Koh (2000) on the Singaporean market. However, the research and literature related to Malaysian stock market is very scarce. Not many researchers have investigated the dynamic short-term and long-term predictability relationship of stock market and the macroeconomic variables. But for Malaysian market there are several studies done by earlier researchers such as Habibullah and Baharumshah (1996), Ibrahim (1999, 2000, 2001), and Ibrahim and Hassanuddeen (2003).

Ibrahim and Hassanuddeen (2003) employ a well-accepted method of cointegration and vector auto regression analyses to capture and evaluate the dynamic relationship among variables and the Malaysia stock market using monthly data from January 1997 to August 1998. Based on the empirical results they suggest the presence of a long-run relationship between these variables and the stock prices and substantial short-run interactions among them. In particular, they document positive short-run and long-run relationships between the stock prices and two macroeconomic variables. The exchange rate, however, is negatively associated with the stock prices. For the money supply, they document immediate positive liquidity effects and negative long-run effects of money supply expansion on the stock prices. Also notes the predictive role of the stock prices for the macroeconomic variables. However, all studies are done to investigate the effects of macroeconomic variables in the conventional stock markets.

There are several studies done by the Malaysian researches on the Islamic stock market. Shabri and Rosylin (2009) explore the influential of macroeconomic variables but focused on

the monetary policy variables towards the Islamic stock market. They found that real effective exchange rate, money supply M3, treasury billrate (TBR) and federal fund rate (FFR) seem to be suitable targets for the government to focus on, in order to stabilize the Islamic stock market and to encourage more capital flows into the market. Addition to that, Faisol (2009), also study the impact of monetary policy variables to Islamic stock market and the author also do comparative analysis on Islamic stock market and the conventional in Malaysia.

For that reason, this present paper would try to investigate the macroeconomic variables by combining the monetary policy which is the money supply, M2 and effective exchange rate, MYR and the other important macroeconomic variables such as the real industry production and consumer price index.

4. The Methodology Used

Time series approaches have been adopted to test the hypothesis whether the macroeconomic variables have an impact on the Islamic stock market.. There are three major contributions of Time Series Technique; (i) This technique tests theory with data without prior assumptions, (ii) the time series techniques embrace the dynamic interaction between variables, and (iii) this technique identifies causality between the variables. Therefore, this study is an attempt to investigate the relationship between the Islamic stock market and macroeconomic variables.

Initially, the first step in modeling time series is to test for the stationarity of the data. A Stationarity test known as unit root tests is Augmented Dickey-Fuller test (ADF), to determine whether the univariate time-series contain a unit root. A series is said to be integrated of order d, denoted $I(d)$, and if d is the number of the time the series must be differenced to achieve stationarity. Thus, $I(1)$ series means that the series must be differenced once to obtain stationarity, while $I(0)$ series is stationary without difference. Then, the second step is

determining the appropriate order of Vector Auto Regression (VAR), which is number of lags in the cointegration model before we continue with the cointegration test. In the cointegration test, which is in the third step, the Johansen cointegration test will apply. In the cointegration test implies that the relationship between the variables is not spurious. In simple word, the cointegration indicates whether or not there is a theoretical relationship between the variables and that they are in equilibrium in the long-run. Followed by four steps that is the Long Run Structural Modeling (LRSM). Mansur, Ali and Haider(2009) state that LRSM is use to estimate theoretically meaningful long-run relations by imposing on those long-run relations both identifying and overidentifying restriction based on theories and priori information of the economies. For testing each restriction, the results are presented in tables and one should check the LR statistic in each case whether the null of restriction should be reject or accepted. Interestingly to note, all four steps above is essential to test the cointegration among the variables.

Second part in the time series technique tells us how the all variables are correlated or affecting each other and they tend to move together in the long run as well as in the short run. In other word, it will tell us the causality among the variables. This is explained by the step five which the Vector Error Correction Model (VECM). This step indicates the direction of variables, whether the variables are endogenous or dependent (follower) or which of variables are exogenous or independent (leader). In addition to that, this step allows us to distinguish between short term and long term Granger-causality. To note here, the VECM cannot give us an indication of the relative strength of the Granger causal chain or the degree of exogeneity and endogeneity of the variables beyond the sample period. Therefore we will use the Variance Decomposition (VDC) technique in which it will partitioning the variance of the forecast error of a certain variable into proportions attributable to shock in each variables in the system including its own. As a result, the VDC technique can provide an indication of these relativities.

The next step is the step seven which is the Impulse Respond Function (IRFs). The information that obtains from this step is equivalent to the VDCs. IRFs initially map out the dynamic response path of a variable due to a one period standard deviation shock to another variable. Thus, this technique gives more or less the same information but in graphical form. To end up the step, we conclude by using the Persistence Profile (PP). This step is estimating the speed with which the economy or the markets return to equilibrium owing to a system – wide shock on the cointegration relations[3].

5. Data, Empirical Result, and Discussion

The analysis considers the correlation between Malaysian Islamic Equity Market represented by KLSE Syari'ah index (FTBMEMS) and the four macroeconomic variables which are the money supply (M2), the real output measured by the Industrial Production index (IP), the price level is measured by Consumer Price index (CPI), and we employ the exchange rate Malaysian Ringgit to US Dollar (MYR). The source of all variables is obtained from Datastream.

As prerequisite, we tested the unit roots all the variables by using the Augmented Dickey Fuller (ADF). We found all the variables are I (1) in their original level form, this is mean all the variables are non stationary and in their differenced form, we found they are stationary. The table below summarizes the result for step 1.

Variable	Test Statistic	Critical Value	Implication
Variables in Level Form			
LFTBMEMS	-2.3772	-3.4875	Variable is non - stationary
LM2	-1.934	-3.4875	Variable is non - stationary
LMYR	-2.5071(AIC)	-3.4875	Variable is non - stationary
	-1.7553(SBC)	-3.4875	Variable is non - stationary
LCPI	-2.1372(AIC)	-3.4875	Variable is non - stationary
	-2.8119(SBC)	-3.4875	Variable is non - stationary
LIP	-2.4072(AIC)	-3.4875	Variable is non - stationary

[3] The information of the 8 steps in Time Series technique was obtained from the lectures notes and the learning process in the class of QM5423 Financial Econometric January 2012.

	-2.0756(SBC)	-3.4875	Variable is non - stationary
Variable	Test Statistic	Critical Value	Implication
Variables in the Differenced Form			
DFTBMEMS	-3.9444	-2.9127	Variable is Stationary
DM2	-4.8956	-2.9127	Variable is Stationary
DMYR	-6.1034	-2.9127	Variable is Stationary
DCPI	-4.3093	-2.9127	Variable is Stationary
DIP	-8.0997	-2.9127	Variable is Stationary

Then we proceed to step 2, which is determine the order of vector auto regression (VAR) that is the number of lags to be used. In this step we found that the optimal order of the VAR could be taken as shown in the table below.

	Choice Criteria	
	AIC	SBC
Optimal order	4	0

Based on the result above, there is conflict between the recommendation of AIC and SBC, therefore we checked for serial correlation for each variable and obtained following results.

Variable	Chi -Sq P-value	Implication at 10 %
DFTBMEMS	0.006	There is Serial Correlation
DM2	0.019	There is Serial Correlation
DMYR	0.089	There is Serial Correlation
DCPI	0.583	There is No Serial Correlation
DIP	0.716	There is No Serial Correlation

From the evidence above, we found there is autocorrelation in 3 out of the 5 variables. As a result, we decided to choose the higher VAR order of 4 which based on the principal of parsimony.

In the next step is cointegration test we employ Johansen cointegration test to identify the cointegration between the variables. Based on the statistical evidence we found that there is cointegration between the variables. It is reported to have one cointegration vector at 95%

significance level on the basis maximal Eigen value. However in the trace statistic we found them have two cointegration vectors at 95%. Based on our intuitive and limited knowledge, we assuming it have only one cointegration vector. This evidence of cointegration indicates that there are relationship among the Islamic equity market and the macroeconomic variables which are have theoretical relationship among variables or they are tend to move together in equilibrium in the long run. We may see the result of cointegration as shown below[4].

Johansen ML results for multiple cointegration vector				
H0	H1	Statistic	95% Crit.	90% Crit.
Maximum eigen value statistic				
r = 0	r ≥ 1	59.0729	37.86	35.04
r ≤ 1	r ≥ 2	31.6148	31.79	29.13
Trace Statistic				
r = 0	r ≥ 1	126. 5967	87.17	82.88
r ≤ 1	r ≥ 2	67.5238	63	59.16

We proceed to the next step which employs the LRSM technique. In this technique we tested the coefficients of the variables against the theoretical relationship or statistical significant. For that case, in this study we focus on the direction of causality between the Malaysian Islamic equity market (FTBMEMS) and the macroeconomic variables. Then we normalizing restriction of unity on the FTBMEMS variable at the exact identifying stage which is refer to panel A. When we imposed a normalizing restriction of unity on the coefficient of FTBMEMS, we found all the coefficients of the cointegrating vector are insignificant. We calculated manually the t-ratio by divide the value of coefficient with the standard error. However their expected sign have the correct sign except for the exchange rate, MYR. Then, we proceed to the over identification stage. In this stage we imposed an over identifying restriction of zero on the all insignificant coefficients. To note here, when we imposed an over identifying for CPI, IP, and M2, it was rejected by the Chi – Square Statistic. Interestingly,

[4] Notes: The statistics refer to Johansen's log-likelihood maximal eigen value and trace test statistics based on cointegration with unrestricted intercepts and restricted trends in the VAR. From the above results, we select one cointegrating vector based on the eigen value at 95% level. The underlying VAR model is of order 4 and is computed using 61 month observations.

when we imposed an over identification to coefficient MYR equal to zero, then the result it was accepted by Chi – Square statistic, or in other words, that set of restrictions is correct. Then, we when proceed with other steps by using new restriction which is in the panel B[5].

Exact and Over Identifying restrictions on the cointegration vector				
	Panel A		Panel B	
LFTBMEMS	1.0000	(None)	1.000	(None)
LM2	-70.4795	(334.6805)	18.694	(18.705)
LMYR	15.1139	(65.8089)	0.000	(None)
LCPI	160.3849	(728.9563)	-39.260	(48.685)
LIP	26.880	(1.327)	-7.273	(5.834)
Trend	0.2650	(1.3265)	-0.071	(0.056)
Log - Likelihood	885.9011		884.632	
Chi - Square	None		2.538	0.111

Therefore, from the above analysis with assuming one cointegration vector, the cointegration vector representing the long run is (normalized the price, FTBMEMS);

FTBMEMS	– 70.4795M2	+ 15.1139MYR	+ 160.3849CPI	+26.880IP	⟶	I(0)
	(334.6805)	(65.8089)	(728.9563)	(1.327)		

These estimated long-run coefficients may be interpreted as elasticity measures since the variables are expressed in natural logarithms. Based on the estimated long – run coefficient, we found the long run estimation for Islamic stock price and industrial production is positive. This is mean the real production is cointegrated with Islamic stock prices or in other word the real production line is directly increase the cash flows of firms. This is similar to the result from Ibrahim and Hassanuddeen (2003), that indicate positive cointegration between the stock prices and real output. The result also obtained the positive correlation between the Islamic stock price

[5]Notes: The statistical evidence shows the maximum likelihood estimates subject to exactly identifying (Panel A) and over identifying (Panel B) restrictions. In a panel A, all variables are not significant but the expected sign is correct except for MYR. In Panel B, the over identifying restriction on MYR = 0 is accepted with a p-value is 0.111, accepting the null, which is the set of restriction is correct. As a result we proceed with Panel B.

and level of price which is Consumer Price index (CPI) in the long run. The result is consistent with the study Ibrahim and Hassanuddeen (2003). The positive correlation would mean the Islamic stock price can be a good hedge product against inflation. In addition to that, the present study recorded that there is also positive relationship between the Islamic stock price and the exchange rate (MYR). This result is different to the earlier research done by Ibrahim and Hassanuddeen (2003), that indicate the stock price have negative correlation with the exchange rate. The positive correlated between the Islamic stock price and the exchange rate of MYR gives indication that, in the long run equilibrium will tend to move together. One of the reasons to expound this situation is the volatility of exchange rate which is arisen from demand and supply of the denominated currency would lead to increases in the level of price in Islamic stock prices. In some words, the increasing of the exchange rate of denominated currency will lead to arising in the cash flows of level of price in Islamic stock market prices. Finally, the study found the negative correlation between the money supply, M2 and Islamic stock price. This result would mean the increasing of money supply in market would bring inflation to the market, as consequences this situation will affect the Islamic stock price. Thus, relationship between Islamic stock price and money supply has negative correlation in the long run. This present result concluded for the relationship of the macroeconomic variables and Islamic stock market in the long run but not to the short term, the result might be different from above.

As mentioned previously, the cointegration just indicates whether the relationship between the variables have cointegration or not. However, this step does not tell us the direction of variables in the sample. In the simple word, the Johansen test does not tell us which variable is leader (independent) or which of the variables is follower (dependent). Therefore, we employ the vector error correction modeling to do this task. The information from this technique is essential to guide the policy maker especially the government and the central bank to smoothen the capital market in their country. In this situation, the policy maker would give more

attention to the exogenous variables that give an impact to the other variables. Therefore by examining the error correction term, e_{t-1}, for each variable, and checking whether it is significant. In this case, the rule of thumb is if the variable is statistically significant, the variable is endogenous. Conversely, if the variable is insignificant, the variable is exogenous. Looking at the significance of the error correction coefficients, we found that the level of price, FTBMEMS is endogenous and the exchange rate, MYR is exogenous. That tends to indicate that FTBMEMS variable responds to MYR variable which is exogenous. The results for other variables are shown below.

Variable	ECM (-1) t ratio p- value	Implication
LFTBMEMS	0.020	Variable endogenous
LM2	0.076	Variable endogenous
LMYR	0.199	**Variable exogenous**
LCPI	0.001	Variable endogenous
LIP	0.000	Variable endogenous

The VECM allows distinguishing between the short term and long term Granger causality. When the variables are cointegrated, then in the short term, deviations from this long term equilibrium will feed back on the changes in the dependent variable in order to force the movement back towards the equilibrium. If the dependent variable is driven directly by this long term equilibrium error, then it is responding to this feedback. If not, it is responding only to short term shocks to the stochastic environment. Therefore, for instance, in the case of FTBMEMS, the coefficient is 0.045. This implies that, when there is shock applied to this index, it would take on average, 4.5 months for the price to get back into equilibrium with the other variables.

Based on the previous step, VECM, it tells us that it will indicate the exogenous variable and the endogenous variable from the sample data. Then, it tells us that the exogenous variable is MYR, which is the exchange rate and the endogenous variables are M2, IP, and CPI including the FTBMEMS. However, this indication does not tell us the relative exogeneity and

endogeneity. We employ variance decompositions to provide the statistical answer. The Variance Decomposition (VDC) technique also known as out-of-sample causality test, by partitioning the variance of the forecast error of certain variable into proportion s attributable to shocks in each variable in the system including its own. Therefore, it can provide an indication of relative exogeneity or endogeneity. In addition to that, the VDC have two ways to conduct the step; (1) Orthogonalized Variance Decompositions and (2) Generalized Variance Decompositions. Both of them are designed to indicate the relative exogeneity and endogeneity of variables by decomposing the variance of the forecast error of a variable into proportion attributable to shock in each variable in the system including its own. Then from the orthogonalized VDCs we obtained the following result. We do forecasting at 12 months and 36 months. In our table, at the end of forecast horizon at 12, the contribution of own shocks towards explaining the forecast error variance for each variable are as follows: FTBMEMS (63%), M2 (64%), MYR (19%), CPI (44%) and IP (21%). And the end of horizon number 36 as follow: FTBMEMS (59%), M2 (62%), MYR (12%), CPI (41%) and IP (7%). Based on the result for both horizons, we conclude that the most exogenous variable is M2 and followed by FTBMEMS, CPI, MYR and the least is IP. However, this result is contradicted with the error correction model that indicates the most exogenous variable is MYR. In order to make it sense, we have to understand the two important limitations of orthogonalized VDCs. Firstly, and importantly, the orthogonalized is generally depend on the particular ordering of the variables in the VAR. Secondly, it assume that when a particular variable is shocked, the other variables in the system are more or less switched off or remain constant. Consequently we had to apply the generalized variance decomposition technique to determine the relative degree of endogeneity or exogeneity of the variables. To note here the variable that is explained mostly by its own shocks (and not by others) is deemed to be the most exogenous of all.

Percentage of forecast variance explained by innovation in : Orthogonalized VDCs

Variables	FTBMEMS	M2	MYR	CPI	IP
FTBMEMS					
month 12	62.75	2.88	9.95	19.34	5.06
month 36	59.08	3.33	11.05	20.57	5.95
M2					
month 12	3.86	63.87	0.47	13.1	18.67
month 36	3.16	62.41	0.532	14.74	19.15
MYR					
month 12	71.48	2.22	18.54	5.48	2.27
month 36	77.91	0.798	11.36	6.67	3.25
CPI					
month 12	3.66	43.91	3.91	43.89	4.63
month 36	1.5	49.59	2.74	41.49	4.67
IP					
month 12	35.49	5.58	6.04	32.72	20.16
month 36	39.1	4.03	8.09	41.39	7.39

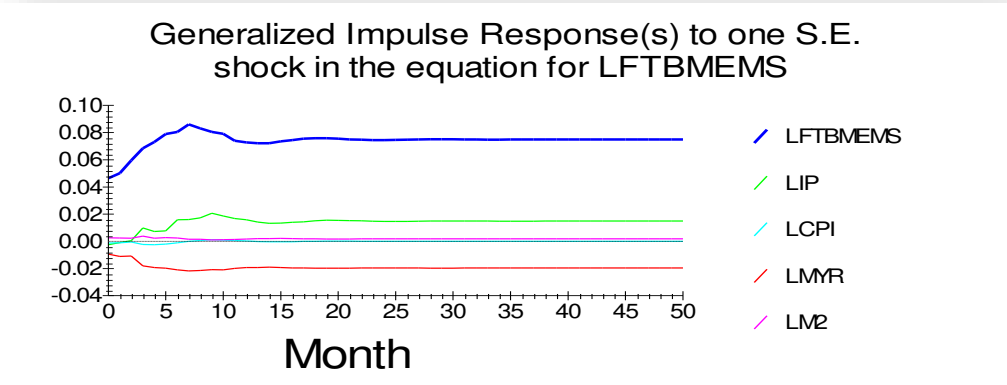
Interestingly, when we do generalized VDCs we found the result for horizon at number 36 is the same as the outcome of orthogonalized VDCs. The result still contradicted the error correction model as follows : M2 (71%) , FTBMEMS (52%), CPI (33%), MYR (25%) and the final one is IP (5.79 %). This result indicates the most exogenous variable is M2 and the least one is IP. The result of both VDCs perhaps the causality among the variables in long run because it tested out of sample beyond the sample period given and the outcome for VECM that indicates the MYR as exogenous is valid within the sample data. Thus, we conclude that the M2 variable is exogenous and the FTBMEMS is endogenous variable in the long run beyond the sample period. This indicates the FTBMEMS variable responds to the M2 variable.

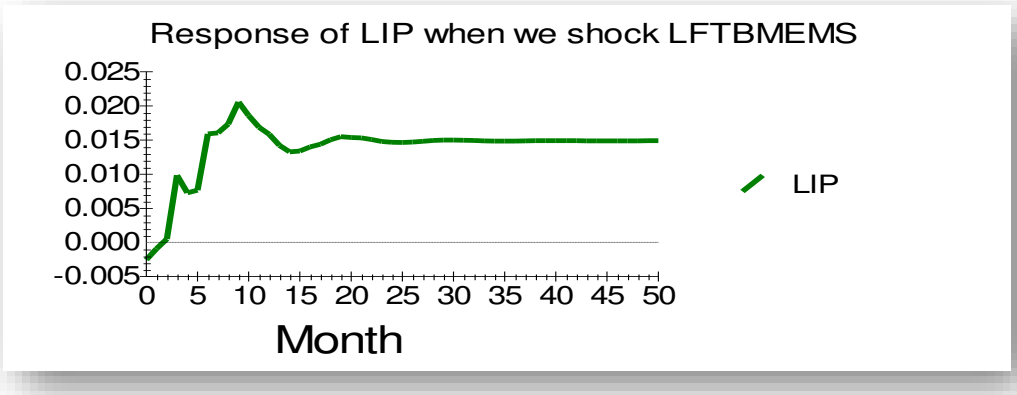
Percentage of forecast variance explained by innovation in : Generalized VDCs					
Variables	FTBMEMS	M2	MYR	CPI	IP
FTBMEMS					
month 36	51.59	2.82	0.816	37.63	7.12
M2					
month 36	2.43	71.68	0.403	8.144	13.71
MYR					
month 36	52.07	1.15	25.02	17.24	4.145
CPI					
month 36	1.25	56.34	5.26	33.2	3.905

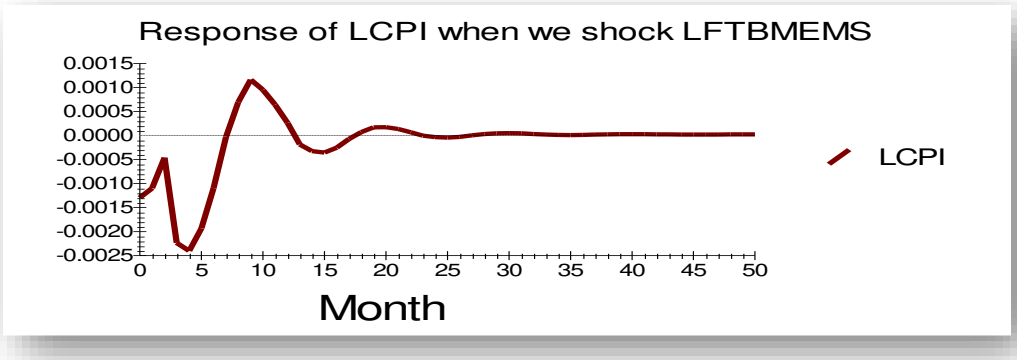
IP					
month 36	34.17	3.2	1.25	55.56	5.79

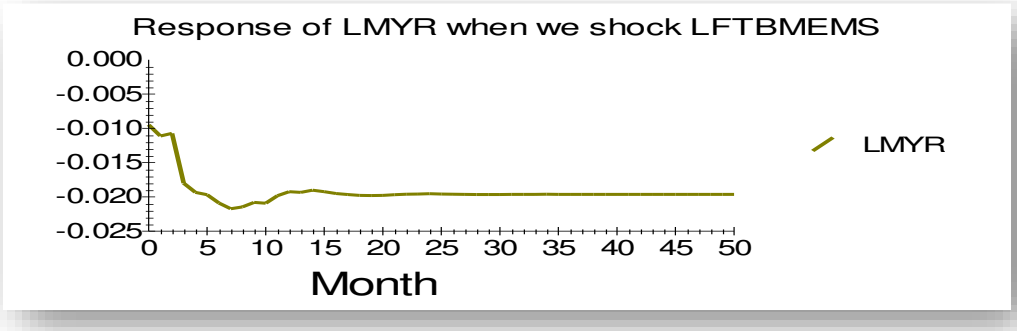
We then applied the generalized Impulse respond function (IRFs) and found that, consistent with the previous VDCs, the result say, the FTBMEMS is more sensitive to a 1% standard deviation shock to the money supply. Thus, the IRFs essentially produce the same information as VDCs, excepting that they can be presented in graphical form. Please refer the graphs below.

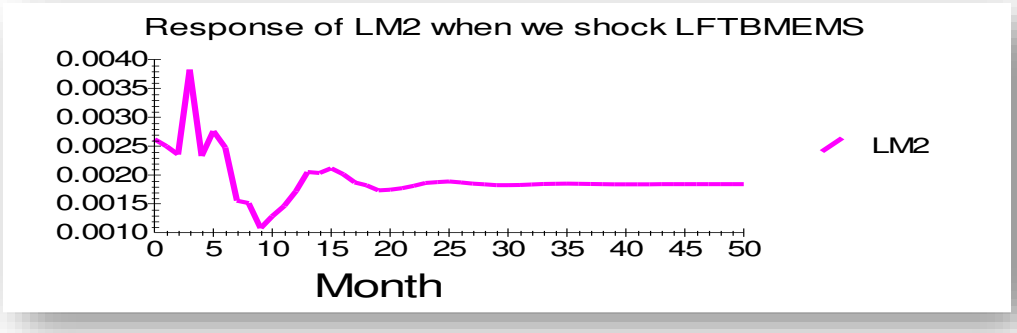
Finally, to end up this time series technique, we use Persistence Profile (PP). The Persistent Profile illustrates the situation when the entire cointegrating vector equation is shocked, and estimates the speed with which the relationship returns to the equilibrium. The graph below would tell us that it would take approximately 15 months for the cointegrating vector equation to be back to equilibrium following a system wide shock.

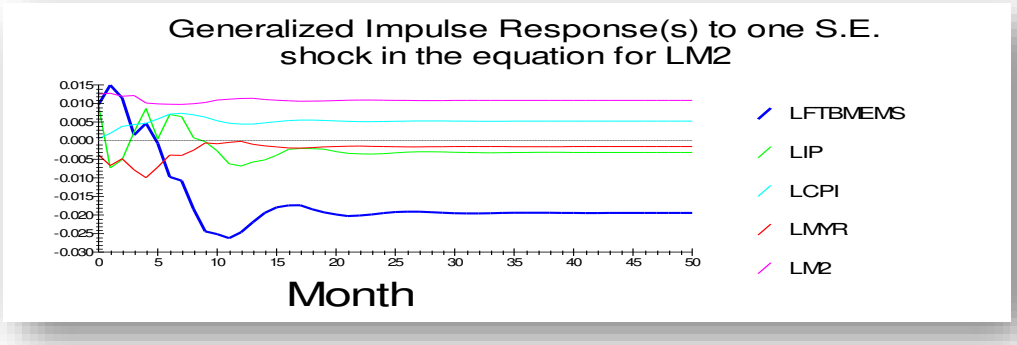


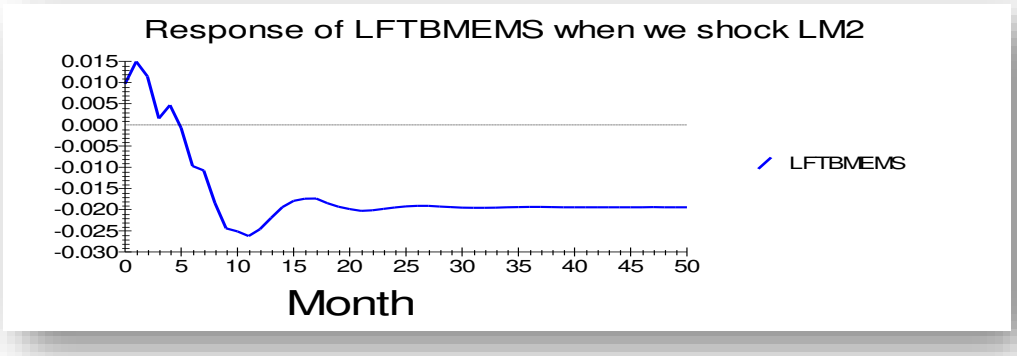

Response of LIP when we shock LFTBMEMS
0.025
0.020
0.015
0.010
0.005
0.000
-0.005
0 5 10 15 20 25 30 35 40 45 50
Month
LIP

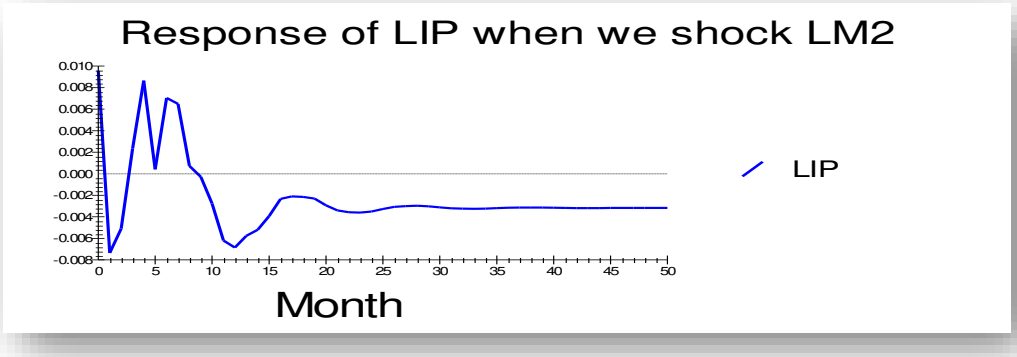

Response of LCPI when we shock LFTBMEMS
0.0015
0.0010
0.0005
0.0000
-0.0005
-0.0010
-0.0015
-0.0020
-0.0025
0 5 10 15 20 25 30 35 40 45 50
Month
LCPI

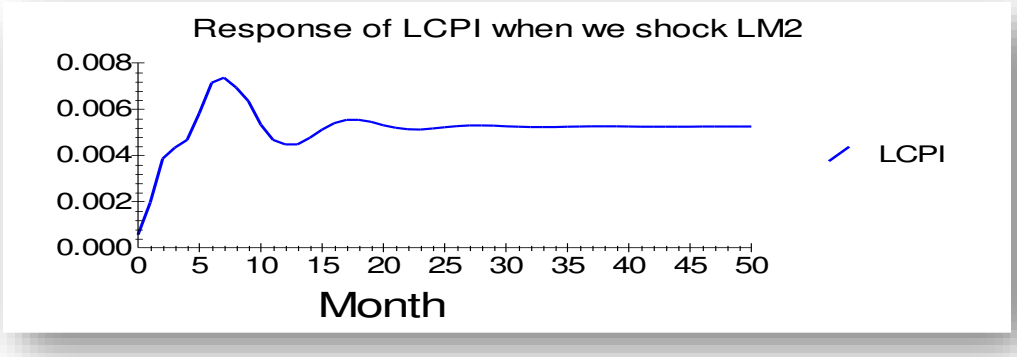

Response of LMYR when we shock LFTBMEMS
0.000
-0.005
-0.010
-0.015
-0.020
-0.025
0 5 10 15 20 25 30 35 40 45 50
Month
LMYR

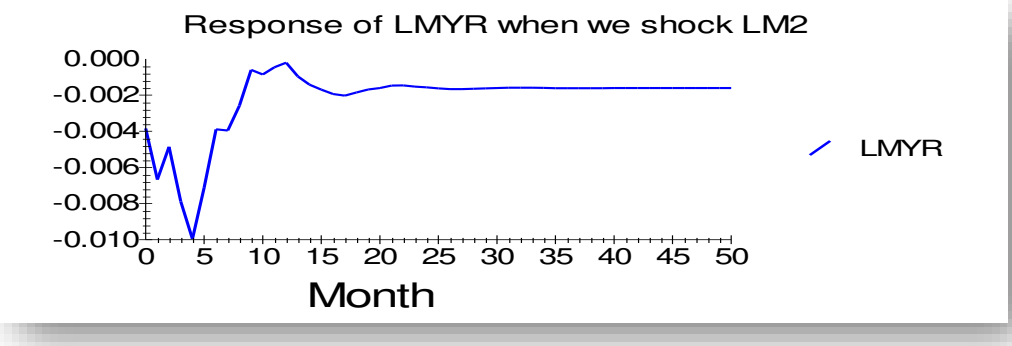

Response of LM2 when we shock LFTBMEMS
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
0 5 10 15 20 25 30 35 40 45 50
Month
LM2

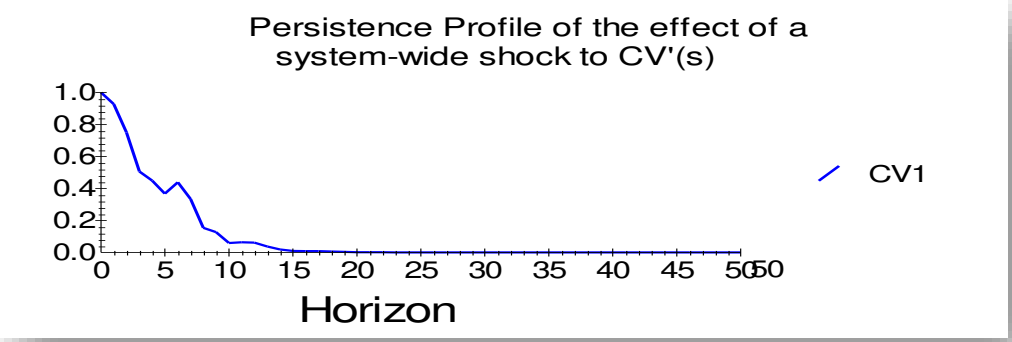

Generalized Impulse Response(s) to one S.E. shock in the equation for LM2
0.015
0.010
0.005
0.000
-0.005
-0.010
-0.015
-0.020
-0.025
-0.030
0 5 10 15 20 25 30 35 40 45 50
Month
LFTBMEMS
LIP
LCPI
LMYR
LM2


Response of LFTBMEMS when we shock LM2
0.015
0.010
0.005
0.000
-0.005
-0.010
-0.015
-0.020
-0.025
-0.030
0 5 10 15 20 25 30 35 40 45 50
Month
LFTBMEMS


Response of LIP when we shock LM2
0.010
0.008
0.006
0.004
0.002
0.000
-0.002
-0.004
-0.006
-0.008
0 5 10 15 20 25 30 35 40 45 50
Month
LIP


Response of LCPI when we shock LM2
0.008
0.006
0.004
0.002
0.000
0 5 10 15 20 25 30 35 40 45 50
Month
LCPI





6. Conclusions and Policy Implications

In conclusion, we revisit the two research question raised at the beginning of present paper. Based on the above time series technique that we employ eight steps to test the cointegration and the causality amongst variables, we suggest the answer to be:

i. For Islamic stock market especially in Malaysia, we found that most of the macroeconomic variables have some impact on explaining the variance of the Islamic stock market.

ii. Based on the VDCs which is a forecast of the variables beyond the sample period, the Islamic stock market is led by the money supply (M2) and followed by the CPI, exchange rate and industrial production.

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